Washington State Department of Transportation

American Public Works Association
Washington State Chapter

Technical Commentary
for
Standard Plan B-23d
Manhole Type 4

General Information

Background: A Type 4 manhole is intended to provide access to either a straight run of pipe or to an underground stormwater detention facility. It cannot be utilized as a junction for a storm or sanitary sewer system when a change in horizontal or vertical alignment occurs. Type 4 manholes have historically been used on large diameter pipe (72 inches and above), when it becomes impractical to provide either a Type 2 or Type 3 manhole.

Manhole Depth: A Type 4 manhole is fabricated by grafting a precast riser section into a hole cut out of a length of pipe. The reinforcing steel in the riser section is welded to the reinforcing steel in the concrete pipe, after which the joint is grouted with mortar. The joint has some resistance to the shear force that tends to push the riser into the pipe manhole, but the height of the riser sections above the joint is limited to 12 feet.

Live Loads: A Type 4 manhole is designed to withstand highway live loads, but it is recommended that the manhole and ring and cover be located outside of the traveled way whenever possible. This will minimize the long term impacts of repeated highway loadings.

Other Alternatives: The plan shows a reinforced concrete pipe with a concrete riser section. The same type of configuration can be utilized for corrugated metal detention vaults and risers, but with some modifications. Unlike concrete, the joint between the corrugated metal vault and riser is very susceptible to shear failure, especially if highway loads are placed on the ring and cover. If the metal riser is to be located in the traveled way, a load bearing concrete cap must be specified so that highway loads will be transmitted to the soil and not the riser. Attached to this document is a sheet detailing the concrete cap. Although designed to withstand highway live loads, it is recommended that the corrugated metal manhole and riser be placed outside of the traveled way whenever possible.

Applicable Specifications

6-02.3	Construction Requirements for Concrete Structures
7-05	Manholes, Inlets, and Catch Basins
9-04.3	Joint Mortar
9-05.15(1)	Manhole Ring and Cover
9-12.4	Precast Concrete Manholes

Referenced Standard Plans

B-1z	Miscellaneous Details for Manholes and Catch Basins
B-25	Manhole Ring and Cover

Other Information

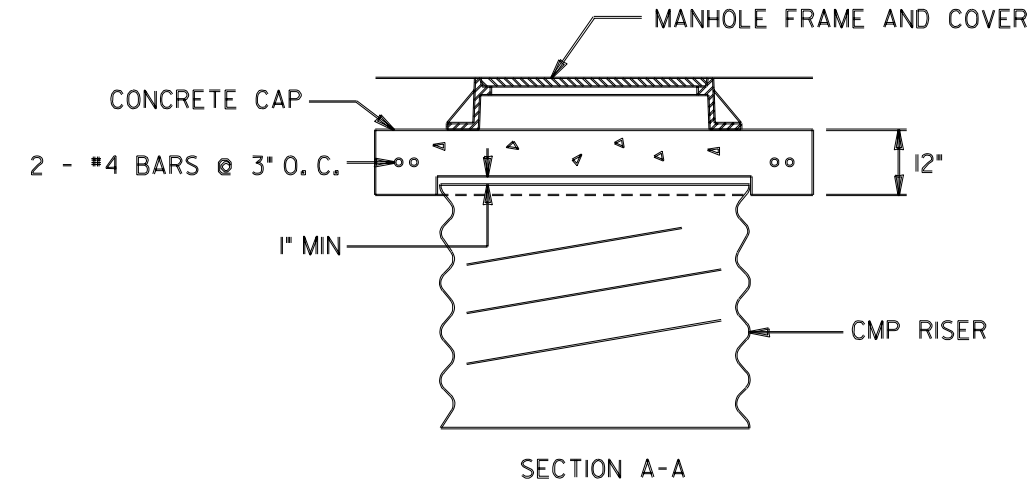
Standard Item Number: N/A

This commentary sheet is maintained by the Olympia Service Center Hydraulics Branch. Please send any suggestions for additions or modifications to :

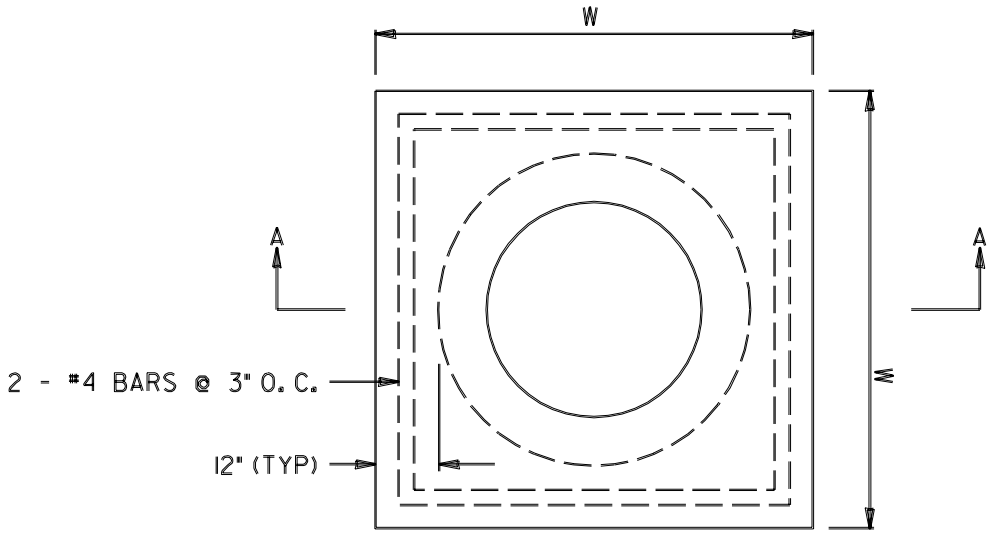
Postal	E-mail
Transportation Building P.O. Box 47329 Olympia, WA 98504-7329 Attn: Matt Witecki	matt- witecki@wsdot.wa.gov

Last Updated: September 17, 1997

Concrete Cap for CMP Riser



SECTION A-A



PLAN VIEW

This design is for use with CMP risers up to 48 inches in diameter.

CMP Riser Diameter (in)	W (ft)
24	4
36	5
48	6